RECEIVED
CENTRAL FAX CENTER
SEP 0 9 2004

(19) FEDERAL REPUBLIC OF GERMANY
GERMAN PATENT OFFICE

(51) Int. Cl. [3]
A 61 F 1/03

(17) **PATENT DISCLOSURE**
(11) **DE 3314210 A1**

(21) File: P 33 14 210.6
(22) Application date: 04/20/1983
(43) Disclosure date: 01/05/1984

DE 33 14210 A1

(30) Union priority:(32) (33) (31)

06/24/1982 CH 3902-82

(71) Applicant:

Gebruder Sulzer AG, 8401 Winterthur, CH

(74) Representative:

Sparing, K., Rohf, W., 4000 Dusseldorf

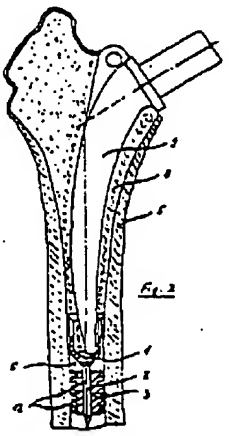
(72) Inventor:

Weber, Bernhard Georg, 8000 St. Gallen, CH; Frey, Otto, 8400 Winterthur, CH

Application for examination in accordance with Patent Law § 44 is submitted

(54) Centering device for the free end of an anchoring shaft of an endoprosthesis for a joint

In order to avoid faulty positioning of the shaft (9) of a prosthesis, in particular the resting of the shaft (9) directly on the cortical bone tissue (5), the free end of the shaft (9) is gripped and centered in a cup-like receptacle (1) that is in turn fixed at the planned depth by a medullary space cement-barrier (3). (33 14 210)



DE 33 14210 A1

Patent Claims

1. Centering device for the free end of an anchoring shaft of an endoprosthesis for a joint, in particular a hip joint prosthesis, which is anchored in the bone by means of bone cement, in which to seal off the cement-filled bone cavity from the further medullary space a medullary space cement-barrier is provided, characterized by a cup-like receptacle (1, 10), the rim (4) of which can be spread and bent towards the exterior to hook in the bone tissue (5).

2. Centering device as in claim 1, characterized by the fact that a retention pin (2) is provided on the bottom of the cup for insertion into the medullary space cement-barrier (3).

3. Centering device as in Claim 1, characterized by the fact that a medullary space cement-barrier (11) is added to the bottom of the cup (10).

3314210

P. 5730/Wg/IS

Gebruder Sulzer Aktiengesellschaft, Winterthur/Switzerland

Centering device for the free end of an anchoring shaft of an endoprosthesis for a joint

The invention relates to a centering device for the free end of an anchoring shaft of an endoprosthesis for a joint, in particular a hip joint prosthesis, that is anchored in the bone by means of bone cement, in which for the sealing-off of the cement-filled bone cavity from the further medullary space a medullary space cement-barrier is provided.

It is a well-known technique to seal off the bone-cement-filled, artificially-provided surgical cavity in the medullary space of a long bone that serves for the accommodation of the anchoring shaft of an endoprosthesis, from the adjacent part of the medullary space by means of a medullary space cement-barrier. (CH-PS 625 119).

Especially in relatively wide medullary spaces, the anchoring of prostheses of this kind has given difficulties in finding the correct position of the shaft in the bone during the operation and thus assuring the correct final positioning of the prosthesis. Defective positioning of the shaft leads, due to incorrect and non-anatomical moments of load, to local peak stresses on the bone, for example due to the resting of the shaft against the cortical bone tissue; these peak stresses result in bone damage and bone degradation as well as above-average peak loads on the shaft of the prosthesis.

The problem for the invention, therefore, is to eliminate as far as possible the danger of these kinds of faulty positioning, or at least to diminish it.

This problem is solved according to the invention by means of a cup-like receptacle, the rim of which can be spread out and bent towards the exterior to hook in the bone tissue.

On insertion of the prosthesis, the end of the shaft is supported in the cup of the receptacle, the spreadable rim of which is supported on the wall of the surgical cavity, formed of cortical bone tissue, and thus effectuates a centering of the cup. At the same time a centering of the end of the shaft in the surgical cavity is thus achieved by means of which the direct contact of the shaft with the lateral outer side of the surgical cavity, even along only part of its length, is avoided.

The fixation of the cup-like receptacle in combination with the medullary space cement-barrier can result easily in two ways. Either the bottom of the cup has a retaining pin for insertion into the medullary space barrier, or the latter is fastened directly on the bottom of the cup.

Like the known medullary space barrier, the centering device is advantageously composed of a plastic material common in implant technology, in particular polyethylene.

The invention is further illustrated below by means of execution examples in association with the drawings.

Fig. 1 shows, magnified, an example of the execution of the centering device;

Fig. 2 is an axial longitudinal section through the upper end of a femoral bone into which the shaft of a hip joint prosthesis is inserted and centered by means of the centering device in accordance with Fig. 1;

Fig. 3 shows a second form of execution in the same view as in Fig. 2.

The basically cylindrical cup-like receptacle 1 (Fig. 1), which is advantageously composed of plastic, in particular of polyethylene, has on its bottom a retention pin 2; this serves for the insertion of the receptacle 1 into a central bore-hole of a known medullary space cement barrier 3 (Fig. 2).

Of course, it is also possible to provide a screw or adhesive connection instead of the pin-and-socket connection between the medullary space barrier 3 and the pin 2. Further, it is possible to make the medullary space barrier 3 and the centering device as a combined element, with a cup 10 and a cement barrier 11 mounted on its bottom in one piece; Fig. 3 shows this type of execution.

The free rim 4 of the receptacle 1 is bent out towards the exterior and tapers to a point with which the rim 4 can hook into the cortical wall 5 (Fig. 2) of the surgically prepared medullary cavity 6.

On its entire periphery, the rim 4 is provided with incisions 7 running parallel to the central axis, that run to approximately half [typo in original] the height of the cup. They serve to make the rim 4 of the receptacle 1 spreadable.

In the insertion of the new centering device, the procedure is advantageously such that first the medullary space 6 is surgically reamed out and prepared to the desired depth; then in the known manner the medullary space cement barrier 3 or the element 10, 11 is fixed at the planned "standard" height and - in the first form of execution - connects the medullary space barrier to the cup-like receptacle 1. Then the medullary cavity above the receptacle 1 or 10 is filled with bone cement; before this hardens, the shaft 9 of the prosthesis to be anchored is pressed in until the free end of the shaft rests on the bottom of the receptacle 1.

The fixation of the centering device at the "correct" height thus results not only by the hooking of the thread 12 of the cement barrier 3 or 10 in the cortical bone wall 5 of the medullary cavity 6, but

also - especially after the shaft 9 is pressed in the bone-cement-filled medullary cavity 6 - by the engagement of the spreadable rim 4 of the receptacle 1 or 10 in this wall 5.

As can be seen from Figs. 2 and 3, the free end of the shaft 9 is centered in the medullary cavity 6 by means of the centering device in such a way that the shaft 9, surrounded over its whole length by a cement bed 8, extends freely in the medullary cavity 6 without resting directly on this wall 5 of cortical bone tissue.

3314210

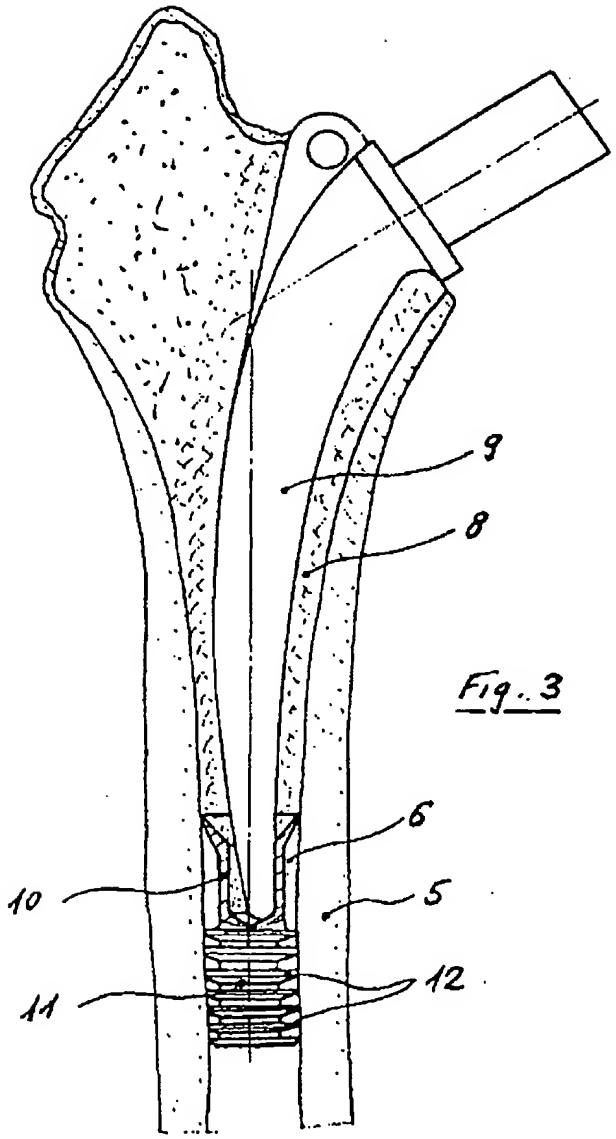


Fig. 3

3314210

Number: 33 14 210
Int. Cl.:[3] A 61 F 1/03
Application date: April 20, 1983
Date of disclosure: January 5, 1984

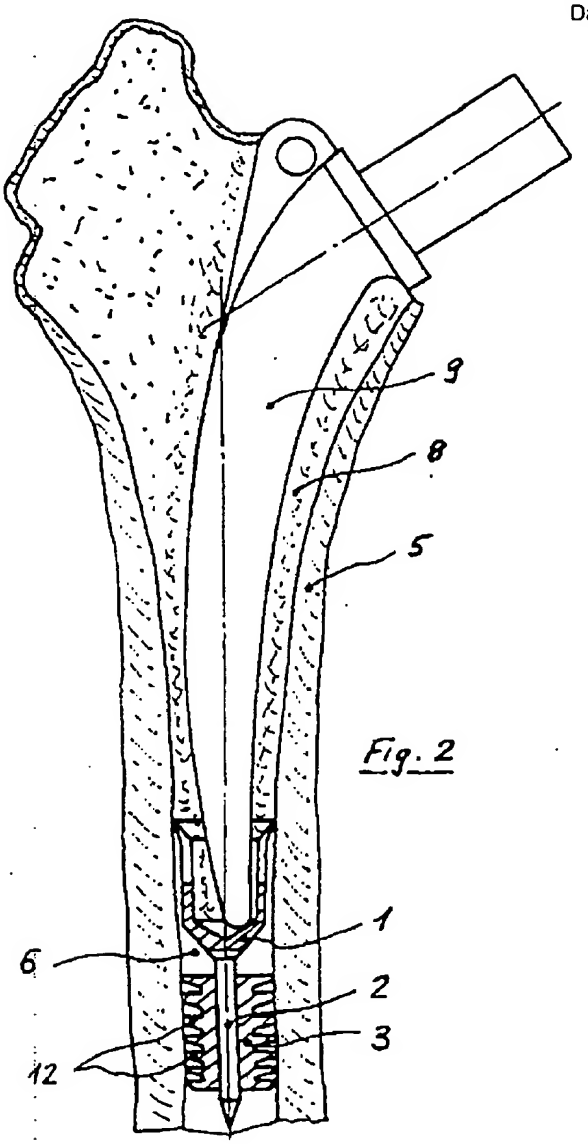


Fig. 2

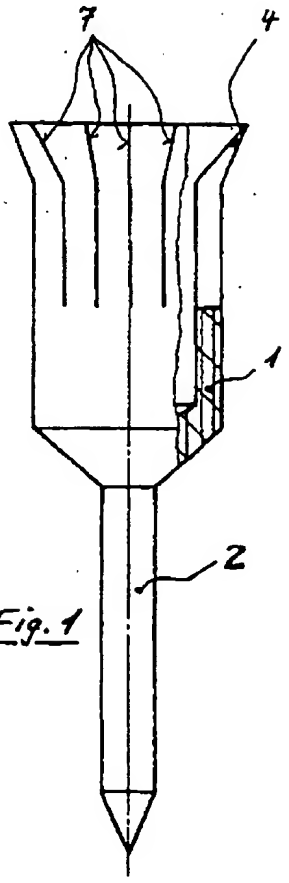


Fig. 1